Range there seems to be all possible varieties and combinations of soils.

The nature of California soils can better be shown by taking some representative soils in the various districts, and giving the complete analysis from several different localities.

Bench Lands and Sierra Foot-hills.

	Fresno Plains.	Red Loam.	Red Foot-hills.	Red Chaparral.
Insoluble matter, and silica	88.579	82.592	69.52	68.864
Potash	.340	.249	.38	.417
Soda	.248	.035	.07	.052
Lime	1.163	1.021	.96	.288
Magnesia	.499	.471	1.09	.207
Br. oxide of manganese	.034	.018	.39	.067
Peroxide of iron	3.267	5.811	12.42	7.705
Alumina	3.221	6 283	10 97	14.443
Phosphoric acid	.097	.043	.16	.047
Sulphuric acid	.117	.019	.01	.074
Water and organic matter	1.789	3.644	5.14	7.680
Total	99.368	100.186	101.11	99.815

The famous bed-rock land, long considered worthless, lies on the borders of the valley. The soluble silica runs to six and eight per cent; alumina, above five per cent. There are only small quantities of potash, soda, and magnesia, but the sub-soil in a measure supplies these deficiencies. Lime is in adequate quantity. This is the soil where giant-powder is used to break up the bed-rock when planting orchards, and the trees afterwards thrive.

The dry bog soil is immensely rich, equal in native qualities to the famous buckshot soils of the Yazoo bottoms, but the surplus of alkaline salts prevents its use until reclaimed by fresh water or gypsum. The wire-grass soil is highly productive. There is a little alkali, but not enough to injure it. The brown adobe is a very representative soil, deep reddish brown in color, contains much sand, and is easily tilled.

Southern California Soils.

	Mojave Desert.	San Gabriel Valley.	Mesa Land.	Silty Soil. Lower Bench.
Insoluble matter and soluble silica	75 964	81.12	86.21	87.511
Potash	.928	.27	.48	.634
Soda	.078	.17	.14	.070
Lime	1.787	.68	.36	.759
Magnesia	1.782	1.77	.54	.593
Br. oxide of manganese	.026	.10	.01	.025
Peroxide of iron	5.478	6.30	3.69	3.350
Alumina	9.227	6.79	5.12	3 095
Phosphoric acid	.056	.16	.23	.200
Sulphuric acid	.012	.07	.03	.003
Carbonic acid	.456	—	—	—
Water and organic matter	3.903	3.07	2.60	3.132
Total	99.697	100.50	99.50	99.372

The foot-hill region ranges in width from ten to fifteen miles. The soils show very considerable differences, but the greater portion are of a "fair to high quality." There is a "mountain adobe" of the high valleys, which in some cases runs very high in magnesia, alumina, and ferric oxide. The "mining slum" is of exceedingly varying quality, some of it worthless for a long time; in other sections, a fair garden soil almost immediately. A large percentage of lime is present in many cases in the mining *débris*, or sediment.

The soils of the southern region—south of Tehachipi—are perhaps as varied as in any part of California. The great Mojave Desert is one of the important features. Here extensive tracts only lack water to make them of much cultural value. In fact, this high plain has ample lime and potash, though little humus, and hardly enough phosphoric acid. The arable lands of southern California consist of "bottoms," bench lands, mesas or high bench lands, mountain soils, and seacoast soils. The coast valleys are strong in phosphates; the mountain lands have more lime and humus. Reddish gravelly soils, excellent for fruit, are a characteristic feature.

There is a silty soil in many places, which retains its tilth so well that a man can easily thrust an axe-handle down to the head in the light-umber soil.

The Coast Range, like southern California, has so wide a range of sorts that a hundred analyses would not be sufficient to exhaust the number of typical cases. Many of the light soils show an especial power for absorbing moisture, and a high percentage of humus. Phosphates will probably be the first things to be exhausted. As a rule, they are adapted to fruits rather than to grains. There are black adobe soil, redwood bottom, yellow and brick-red mountain soils, gravels, loams, and almost every possible variety and combination.

CHARLES HOWARD SHINN.
Niles, Cal., Sept. 3.

BOOK-REVIEWS.

An American Geological Railway Guide. By JAMES MACFARLANE. 2d ed., revised and enlarged. New York, Appleton. 8°.

FROM a geologic point of view, this is a model handbook for tourists. The names of the railway stations are arranged as in an ordinary time-table, with the distances in miles from the beginning of the line; but, instead of the times of running trains, the traveller is informed of the age of the bed rocks and the height of each station in feet above the sea. Abundant footnotes also call attention to localities of special interest to the collector of fossils and minerals, or to quarries, mines, oil or gas wells, remarkable waterfalls, gorges, or mountain views.

Dr. Macfarlane is well known by his earlier work, "The Coal Regions of America." Since his death in 1885, his son has bestowed much care and effort, during the scanty leisure allowed by professional duties, to the completion of this new edition of the "Railway Guide." In this work he has been aided by many geologists, both of this country and Canada, who have contributed the portions relating to the regions covered by their field-work. Among these names we note Broadhead, J. L. and H. D. Campbell, Chamberlin, Chance, Chester, Collett, Condon, Cooper, Crosby, Dana, Darton, Davis, G. M. Dawson, Dwight, Emmons, Fontaine, Gannett, Gesner, Gilbert, Hague, Hall, Hilgard, Hitchcock, Hunt, Irving, Johnson, Kerr, Lesley, Loughridge, McGee, Newberry, Orton, Owen, Procter, Pumpelly, W. B. Rogers, Russell, Safford, Shaler, Smith, Smock, Stevenson, St. John, Todd, Uhler, Upham, White, Whitfield, G. H. Williams, Willis, A. and N. H. Winchell, Worthen, Wright. The book is prefaced by tables of the geologic formations and their descriptions, occupying about fifty pages, "intended for railway travellers who are not versed in geology."

A Stem Dictionary of the English Language. By JOHN KENNEDY. New York, Barnes (Amer. Book Co.). 8°.

THE author of this work believes that children in learning to read should trace words back to the stem from which they are derived, but that in so doing they should not go out of the bounds of their own language. Thus, he holds that *bene-* in the word *benefit* should be treated as the stem of the word, without regard to its previous history in Latin. With this view he has prepared this dictionary, giving the most important stems derived from Latin and other tongues, with the principal words in which they occur and their definitions, and also the foreign words from which they are derived. Stems of Saxon origin are not usually given,